

DEPARTMENT OF TRANSPORTATION, U.S. COAST GUARD

LIGHT LIST

Volume V

MISSISSIPPI RIVER SYSTEM

2002 Edition

**This publication contains a list of lights,
buoys, daybeacons, bridges, locks and dams.**

Includes corrections through:
Eighth Coast Guard District Local Notice to
Mariners (Mississippi River Edition)
No. 06/02, February 5, 2002

IMPORTANT

*THIS PUBLICATION SHOULD BE CORRECTED
EACH WEEK FROM THE LOCAL NOTICES TO MARINERS
OR NOTICES TO MARINERS AS APPROPRIATE.*

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Distance Finding Chart for the Mississippi River System

Compiled from mileage shown in Light List

NOTE: To determine mileage to New Orleans, La (foot Canal St.), add 133 miles to distance found to Baton Rouge, La.

[illegible]

PREFACE

Lights and other marine aids to navigation, maintained by or under authority of the United States Coast Guard, on the Mississippi River System are listed in this volume with aids to navigation listed consecutively for each river in the system. The rivers are arranged in alphabetical order.

Not every light, buoy or other signal which may be encountered by the mariner is listed. For example, mooring buoys and other marks which lack navigational significance are generally not listed. Also, since bridges and oil wells characteristically display standard markings, individual descriptions of such structures are not included.

PRIVATE AIDS TO NAVIGATION

Included: Class I aids to navigation on marine structures or other works which the owners are legally obligated to establish, maintain, and operate as prescribed by the Coast Guard.

Included: Class II aids to navigation exclusive of Class I, located in waters used by general navigation.

Not included: Class III aids to navigation exclusive of Class I and Class II, located in waters not ordinarily used by general navigation.

This Light List is published biennially and is intended to furnish more complete information concerning aids to navigation than can be conveniently shown on charts. It is not intended to be used during navigation in place of charts. Charts should be consulted for the location of all aids to navigation. It may be dangerous to use aids to navigation without reference to charts.

This list is corrected to the date of the Local Notice to Mariners shown on the title page. Changes made to aids to navigation during the year are published in U.S. Coast Guard Local Notices to Mariners. Important changes to aids to navigation are also broadcast through Coast Guard radio stations. Mariners should keep their Light Lists, charts and other nautical publications corrected from these notices and should consult all notices issued after the date of publication of this Light List.

IMPORTANT: A summary of corrections for this publication, which includes corrections from the dates shown on the title page to the date of availability, is published in the Local Notice to Mariners. These corrections must be applied, in order to bring the Light List up-to-date. Additionally, this publication should be corrected weekly from the Local Notices to Mariners.

Mariners and others are requested to bring to the attention of the District Commander (see pg. v) or U.S. Coast Guard Navigation Center Charting Branch, 7323 Telegraph Road, Alexandria, Va 22315-3940, any apparent errors or omissions in these lists.

The 2002 edition supersedes the 2000 edition.

RECORD OF CORRECTIONS PUBLISHED IN LOCAL NOTICES TO MARINERS

YEAR 20__

1	12	23	33	43
2	13	24	34	44
3	14	25	35	45
4	15	26	36	46
5	16	27	37	47
6	17	28	38	48
7	18	29	39	49
8	19	30	40	50
9	20	31	41	51
10	21	32	42	52
11	22			

YEAR 20__

1	12	23	33	43
2	13	24	34	44
3	14	25	35	45
4	15	26	36	46
5	16	27	37	47
6	17	28	38	48
7	18	29	39	49
8	19	30	40	50
9	20	31	41	51
10	21	32	42	52
11	22			

COAST GUARD DISTRICT COMMANDERS

<u>DISTRICT</u>	<u>ADDRESS</u>	<u>WATERS OF JURISDICTION</u>
FIRST	408 Atlantic Avenue Boston, MA 02110-3350 PHONE: DAY 617-223-8338 PHONE: NIGHT 617-223-8558	Maine, New Hampshire, Massachusetts, Vermont (Lake Champlain), Rhode Island, Connecticut, New York, to Shrewsbury River, New Jersey.
FIFTH	Federal Building; 431 Crawford Street; Portsmouth, VA 23704-5004 PHONE: DAY 757-398-6486 PHONE: NIGHT 757-398-6231	Shrewsbury River, New Jersey to Delaware, Maryland, Virginia, District of Columbia and North Carolina.
SEVENTH	Brickell Plaza Federal Building 909 SE 1st Avenue; Rm: 406 Miami, FL 33131-3050 PHONE: DAY 305-415-6730 PHONE: NIGHT 305-415-6800	South Carolina, Georgia, Florida to 83° 50'W, and Puerto Rico and adjacent islands of the United States.
EIGHTH	Hale Boggs Federal Building 501 Magazine Street New Orleans LA 70130-3396 PHONE: DAY 504-589-6277 PHONE: NIGHT 504-589-6225	Florida westward from 83°50'W, Alabama, Mississippi, Louisiana, Texas, the Mississippi River System except that portion of the Illinois River north of Joliet, Illinois.
NINTH	1240 East 9 th Street Cleveland, OH 44199-2060 PHONE: DAY 216-902-6060 PHONE: NIGHT 216-902-6117	Great Lakes and St. Lawrence River above St. Regis River.
ELEVENTH	Coast Guard Island Building 50-6 Alameda, CA 94501-5100 PHONE: DAY 510-437-2976	California.
THIRTEENTH	Federal Building 915 Second Avenue Seattle, WA 98174-1067 PHONE: DAY 206-220-7270 PHONE: NIGHT 206-220-7004	Oregon, Washington, Idaho, and Montana.
FOURTEENTH	Prince Kalanianaʻole Federal Bldg. 300 Ala Moana Blvd 9th Floor, Room 9139 Honolulu, HI 96850-4982 PHONE: DAY 808-541-2315 PHONE: NIGHT 808-541-2500	Hawaiian, American Samoa, Marshall, Marianas, and Caroline Islands.
SEVENTEENTH	P.O. Box 25517 Juneau, AK 99802-5517 PHONE: DAY 907-463-2262 PHONE: NIGHT 907-463-2004	Alaska.

INTRODUCTION

Arrangement. Aids to navigation on the Mississippi River System are listed in this volume. In addition, Bridges, Locks and Dams, and in some instances cities, towns and minor tributaries are also listed.

Aids to navigation are arranged in downstream order for each river listed in the "contents." The mileage of the aid to navigation determines its position in the list. The origin, or mile zero, of most rivers is coincident with the river mouth. If otherwise, the origin point is named in the heading of the section. Aids to navigation are shown located on either the left or right bank when heading downstream, or as sometimes stated, on the "left descending" or the "right descending" bank. At the end of the formal list are Indexes of Cities, Towns, Landings and Mileage Chart, all usefull in determining river mileage between points on the Mississippi River System.

Names of aids to navigation are printed as follows to help distinguish at a glance the type of aid to navigation listed:

RIVER MOUTHS and CITIES

Bridges, Locks, and Dams

LIGHTS

Lighted Buoys

Daybeacons and Unlighted Buoys

Light List numbers are assigned to all aids to navigation in order to facilitate reference in the Light List and to resolve ambiguity when referencing aids to navigation. As important as mileage is in determining the location of a paticular aid along the river, the Light List number will further assist the mariner in identifying exactly, any item within the Light List, especially in those instances when two or more aids to navigation may be found at the same location (mileage/bank). Aids to navigation are numbered by fives in accordance with their order of appearance in each volume of the Light List. Other numbers and decimal fractions are assigned where newly established aids to navigation are listed between previously numbered aids to navigation. The Light Lists are renumbered periodically to assign whole numbers to all aids to navigation.

DESCRIPTION OF COLUMNS

Column (1): Light List number.

Column (2): Name of aid to navigation and descriptive location. Also includes names of Cities, River Mouths, Bridges, Locks and Dams. When reporting defects or making reference to aids to navigation in correspondence, the full name of the aid to navigation, including Light List number and mileage should be given.

Column (3): Mileage to the nearest tenth of a mile.

Column (4): Bank (left or right) as seen when proceeding downstream.

Column (5): Light characteristic for lighted aids to navigation.

Column (6): Structural characteristic of the aid to navigation, including; daymark (if any). Up and down daymarks are both listed when appropriate. A designation listed in the *Up* column indicates the dayboard is facing upstream to aid the mariner going downstream, while a designation in the *Down* column indicates the dayboard is facing downstream to aid the mariner going upstream.

Column (7): General remarks, including bridge clearances, lock information, seasonal remarks and private aid to navigation identification.

Abbreviations used in the Light Lists.

AHP - Above Head of Passes	It - Lighted
Al - Alternating	MHZ - Megahertz
bl - blast	Mo - Morse Code
C - Canadian	Oc - Occulting
ec - Eclipse	ODAS - Anchored Oceanographic Data Buoy
ev - Every	Q - Quick (Flashing)
F - Fixed	Ra ref - Radar reflector
fl - flash	R - Red
Fl - Flashing	s - seconds
FS - Fog Signal	si - silent
Fl(2) - Group flashing	SPM - Single Point Mooring Buoy
G - Green	W - White
I - Interrupted	Y - Yellow
Iso - Isophase (Equal interval)	
kHz - Kilohertz	
LFl - Long Flash	

RELATED PUBLICATIONS

OTHER LIGHT LISTS PUBLISHED BY THE U.S. COAST GUARD

VOLUME I, ATLANTIC COAST, describes aids to navigation from St. Croix River, Maine to Shrewsbury River, New Jersey.

VOLUME II, ATLANTIC COAST, describes aids to navigation from Shrewsbury River, New Jersey to Little River, South Carolina.

VOLUME III, ATLANTIC AND GULF COASTS, describes aids to navigation from Little River, South Carolina to Econfina River, Florida and includes Puerto Rico and U.S. Virgin Islands.

VOLUME IV, GULF OF MEXICO, describes aids to navigation from Econfina River, Florida to Rio Grande, Texas.

VOLUME VI, PACIFIC COAST AND PACIFIC ISLANDS, describes aids to navigation on the Pacific coast and outlying Pacific islands.

VOLUME VII, GREAT LAKES, describes aids to navigation on the Great Lakes and the St. Lawrence River above the St. Regis River.

Coast Guard Light Lists are sold by the Superintendent of Documents, U.S. Government Printing Office (GPO) and by GPO Sales Agents.

NOTICES TO MARINERS

Broadcast Notices to Mariners are made by the Coast Guard through Coast Guard and Navy radio stations. These broadcast notices, which are broadcast on VHF-FM, NAVTEX, and other maritime frequencies, are navigational warnings that contain information of importance to the safety of navigation. Included are reports of deficiencies and changes to aids to navigation, the positions of ice and derelicts, and other important hydrographic information.

Radio stations broadcasting Notices to Mariners are listed in the National Ocean Service Coast Pilots and in the National Imagery and Mapping Agency publication Radio Navigational Aids (RAPUB 117).

Local Notices to Mariners (U.S. regional coverage) are another means by which the

Coast Guard disseminates navigation information for the United States, its territories, and possessions. A Local Notice to Mariners is issued by each Coast Guard district and is used to report changes to, and deficiencies in, aids to navigation maintained by and under the authority of the Coast Guard. Local Notices to Mariners contain other marine information such as channel depths, naval operations, regattas, etc., which may affect vessels and waterways within the jurisdiction of each Coast Guard district. Reports of channel conditions, obstructions, menaces to navigation, danger areas, new chart editions, etc., are also included in the Local Notice to Mariners.

These notices are essential to all navigators for the purposes of keeping their charts, Lights Lists, Coast Pilots and other nautical publications up-to-date. These notices are published as often as required, but usually weekly. They may be obtained, free of charge, by making application to the appropriate Coast Guard district commander (see pg. v). Vessels operating in ports and waterways in several districts will have to obtain the Local Notice to Mariners from each district in order to be fully informed.

Weekly Notices to Mariners (worldwide coverage) are prepared jointly by the National Imagery and Mapping Agency, the U.S. Coast Guard, and the National Ocean Service, and are published weekly by National Imagery and Mapping Agency.

The Weekly Notices to Mariners advise mariners of important matters affecting navigational safety including new hydrographic discoveries, changes in channels and aids to navigation. Also included are corrections to Light Lists, Coast Pilots, and Sailing Directions. Foreign marine information is also included. This notice is intended for mariners and others who have a need for information related to oceangoing operations. Because it is intended for use by oceangoing vessels, many corrections that affect small craft navigation and waters are not included. Information concerning small craft is contained in the Coast Guard Local Notices to Mariners only. The Weekly Notices to Mariners may be obtained free of charge from commercial maritime sources and upon request to Defense Logistics Agency, Defense Supply Center Richmond, ATTN: JNB, 8000 Jefferson Davis Highway, Richmond, VA 23297-5100 or FAX (804) 279-6510, ATTN: Accounts Manager, RMF.

5 NAUTICAL CHARTS AND PUBLICATIONS

Charts and Coast Pilots covering the United States and its territories are published by the National Ocean Service (NOS), Silver Spring, MD 20910, and are for sale by NOS and authorized NOS Sales Agents. A free catalog of available NOS/NOAA products can be obtained from NOS by phone: (301) 436-6990/(800) 638-8972; FAX: (301) 436-6829; or mail: National Ocean Service/NOAA, Distribution Division N/ACC3, Riverdale, MD 20737-1199.

Sailing Directions covering the waters outside of the U.S. and its territories are published by the National Imagery and Mapping Agency and is available from the Superintendent of Documents, U.S. Government Printing Office (GPO). They can be ordered by phone: (202) 512-1800; FAX: (202) 512-2250; or mail: Superintendent of Documents, P.O. Box 371954, Pittsburgh, PA 15250-7954.

Radio Navigational Aids (RAPUB 117) is published by the National Imagery and Mapping Agency. This publication lists selected radio stations (worldwide) that provide services to mariners. Included are stations transmitting radio navigation warnings, radio time signals, medical advice; chapters on distress, emergency and safety traffic; AMVER, and miscellaneous navigational instructions and procedures. Also included are descriptions of long range aids to navigation such as Loran. Discussions and instructions for use of radio navigational aids are also provided. RAPUB 117 is available from the Superintendent of Documents, U.S. Government Printing Office (GPO).

Maps for the Mississippi River System are published by the various District Engineers, U.S. Army Corps of Engineers.

Tide Tables and Tidal Current Tables are no longer printed or distributed by NOS. Private publishing companies are printing the tables using data provided by NOS. These products may be obtained from local stores that carry marine publications.

DEFECTS IN AIDS TO NAVIGATION

Mariners should realize the Coast Guard cannot keep the thousands of aids to navigation comprising the U.S. Aids to Navigation System under simultaneous and continuous observation and that it is impossible to maintain every aid to navigation operating properly and on its assigned posi-

tion at all times. Therefore, for the safety of all mariners, any person who discovers an aid to navigation that is either off station or exhibiting characteristics other than those listed in the Light Lists should promptly notify the nearest Coast Guard unit. Radio messages should be prefixed "COAST GUARD" and transmitted directly to one of the U.S. Government radio stations listed in *Chapter 3, Section 300L, Radio Navigational Aids* (RAPUB 117).

Recommendations and requests for aids to navigation and to report aids to navigation that are no longer needed should be mailed to the Coast Guard district concerned (see pg. v).

U.S. AIDS TO NAVIGATION SYSTEM

The waters of the United States and its territories are marked to assist navigation by the U.S. Aids to Navigation System. This system encompasses buoys and beacons, conforming to the International Association of Lighthouse Authorities (IALA) buoyage guidelines, and other short range aids to navigation.

The U.S. Aids to Navigation System is intended for use with nautical charts. The exact meaning of a particular aid to navigation may not be clear to the mariner unless the appropriate nautical chart is consulted. Information supplementing that shown on charts is contained in the Light List, Coast Pilots, and Sailing Directions.

TYPES OF MARKS

Lateral marks are buoys or beacons indicating the port and starboard sides of a route to be followed, and are used in conjunction with a *conventional direction of buoyage*.

Generally, lateral aids to navigation indicate which side of an aid to navigation a vessel should pass when channels are entered from seaward and a vessel proceeds in the conventional direction of buoyage. Since all channels do not lead from seaward, certain assumptions must be made so the system can be consistently applied. In the absence of a route leading from seaward, the conventional direction of buoyage generally follows a clockwise direction around land masses.

Virtually all U.S. lateral marks are located in IALA Region B and follow the traditional 3R rule of **red, right, returning**. In U.S. waters, returning from seaward and proceeding toward the head of navigation is

generally considered as moving southerly along the Atlantic coast, westerly along the Gulf coast and northerly along the Pacific coast. In the Great Lakes, the conventional direction of buoyage is generally considered westerly and northerly, except on Lake Michigan, where southerly movement is considered as returning from sea

A summary of the port and starboard hand lateral mark characteristics is contained in the following table.

Characteristic	Port Hand Marks	Starboard Hand Marks
Color	Green	Red
Shape (buoys)	Cylindrical (can) or pillar	Conical (nun) or pillar
Dayboard	Green square	Red triangle
Topmark (if fitted)	Cylinder	Cone, point upward
Light Color (if lighted)	Green	Red
Reflector Color	Green	Red
Number	Odd	Even

Preferred channel marks are aids to navigation which mark channel **junctions** or **bifurcations** and often mark wrecks or obstructions. Preferred channel marks may normally be passed on either side by a vessel, but indicate to the mariner the preferred channel. Preferred channel marks are colored with red and green bands.

At a point where a channel divides, when proceeding in the "conventional direction of buoyage", a preferred channel in IALA Region B may be indicated by a modified port or starboard lateral mark as follows:

Characteristic	Preferred channel to starboard	Preferred channel to port
Color	Green with one broad red band	Red with one broad green band
Shape (buoys)	Cylindrical (can) or pillar	Conical (nun) or pillar
Dayboard	Green square, lower half red	Red triangle, lower half green
Topmark (when fitted)	Green square or cylinder	Red triangular cone, point upward
Light Color (if lighted)	Green	Red
Rhythm	Composite group flashing (2+1)	Composite group flashing (2+1)
Reflector color	Green	Red

NOTE: U.S. lateral aids to navigation at certain Pacific islands are located within IALA Region A and thus exhibit opposite color significance. Port hand marks are red with square or cylindrical shapes while starboard hand marks are green with tri-

angular or conical shapes.

CAUTION: It may not always be possible to pass on either side of preferred channel aids to navigation. The appropriate nautical chart should always be consulted.

Non-lateral marks have no lateral significance, but may be used to supplement the lateral aids to navigation specified above. Occasionally, daybeacons or minor lights outside of the normal channel will not have lateral significance since they do not define limits to navigable waters. These aids to navigation will utilize diamond-shaped dayboards and are divided into four diamond-shaped sectors. The side sectors of these dayboards are colored white, and the top and bottom sectors are colored black, red, or green as the situation dictates.

Safe water marks are used to mark fairways, mid-channels, and offshore approach points, and have unobstructed water on all sides. They can also be used by the mariner transiting offshore waters to identify the proximity of intended landfall. Safe water marks are red and white striped and have a red spherical topmark to further aid in identification. If lighted, they display a white light with the characteristic Morse code "A".

Isolated danger marks are erected on, or moored above or near, an isolated danger, which has navigable water all around it. These marks should not be approached closely without special caution.

Isolated danger marks are colored with black and red bands, and if lighted, display a group flashing (2) white light. A topmark consisting of two black spheres, one above the other, is fitted for both lighted and unlighted marks.

Special marks are not intended to assist in navigation, but rather to alert the mariner to a special feature or area. The feature should be described in a nautical document such as a chart, Light List, Coast Pilot or Notice to Mariner. Some areas which may be marked by these aids to navigation are spoil areas, pipelines, traffic separation schemes, jetties, or military exercise areas. Special marks are yellow in color and, if lighted, display a yellow light.

Information and regulatory marks are used to alert the mariner to various warnings or regulatory matters. These marks have orange geometric shapes against a white background. The meanings associated with the orange shapes are as follows:

- 1) An open-faced diamond signifies danger.
- 2) A diamond shape having a cross centered within indicates that vessels are excluded from the marked area.
- 3) A circular shape indicates that certain operating restrictions are in effect within the marked area.

BUOYS AND BEACONS

The IALA maritime buoyage guidelines apply to buoys and beacons that indicate the lateral limits of navigable channels, obstructions, other dangers such as wrecks, and other areas or features of importance to the mariner. This system provides five types of marks: lateral marks, safe water marks, special marks, isolated danger marks and cardinal marks. (Cardinal marks are not presently used in the United States.) Each type of mark is differentiated from other types by distinctive colors, shapes and light rhythms. Examples are provided on the enclosed color illustrations.

Buoys are floating aids to navigation used extensively throughout U.S. waters. They are moored to the seabed by concrete sinkers with chain or synthetic rope moorings of various lengths connected to the buoy body. *Buoy positions represented on nautical charts are approximate positions only*, due to the practical limitations of positioning and maintaining buoys and their sinkers in precise geographical locations. Buoy positions are normally verified during periodic maintenance visits. Between visits, atmospheric and sea conditions, seabed slope and composition, and collisions or other accidents may cause buoys to shift from their charted locations, or cause buoys to be sunk or capsized.

Buoy moorings vary in length. The mooring lengths define a *watch circle*, and buoys can be expected to move within this circle. Actual watch circles do not coincide with the symbols representing them on charts.

CAUTION: Mariners attempting to pass a buoy close aboard risk collision with a yawing buoy or with the obstruction which the buoy marks. Mariners must not rely on buoys alone for determining their positions due to factors limiting buoy reliability. Prudent mariners will use bearings or angles from fixed aids to navigation and shore objects, soundings and various methods of electronic navigation to positively fix their position.

Beacons are aids to navigation which are permanently fixed to the earth's surface. These structures range from lighthouses to small unlighted daybeacons, and exhibit a daymark to make these aids to navigation readily visible and easily identifiable against background conditions. The daymark conveys to the mariner, during daylight hours, the same significance as does the aid to navigation's light at night.

CAUTION: Vessels should not pass fixed aids to navigation close aboard due to the danger of collision with rip-rap or structure foundations, or with the obstruction or danger being marked.

LIGHTED AIDS TO NAVIGATION

Most lighted aids to navigation are equipped with controls which automatically cause the light to operate during darkness and to be extinguished during daylight. These devices are not of equal sensitivity, therefore all lights do not come on or go off at the same time. (Mariners should ensure correct identification of aids to navigation during twilight periods when some lighted aids to navigation are lit while others are not.)

The lighting apparatus is serviced at periodic intervals to assure reliable operation, but there is always the possibility of a light being extinguished or operating improperly. The condition of the atmosphere has a considerable effect upon the distance at which lights can be seen. Sometimes lights are obscured by fog, haze, dust, smoke, or precipitation which may be present at the light, or between the light and the observer, and which is possibly unknown by the observer. Atmospheric refraction may cause a light to be seen farther than under ordinary circumstances.

A light of low intensity will be easily obscured by unfavorable conditions of the atmosphere and little dependence can be placed on it being seen. For this reason, the intensity of a light should always be considered when expecting to sight it in thick weather. Haze and distance may reduce the apparent duration of the flash of a light. In some atmospheric conditions, white lights may have a reddish hue. Lights placed at high elevations are more frequently obscured by clouds, mist, and fog than those lights located at or near sea level.

In regions where ice conditions prevail in the winter, the lantern panes of unattended lights may become covered with ice

5 or snow, which will greatly reduce the visibility of the lights and may also cause colored lights to appear white.

10 The increasing use of brilliant shore lights for advertising, illuminating bridges, and other purposes, may cause marine navigational lights, particularly those in densely inhabited areas, to be outshone and difficult to distinguish from the background lighting. Mariners are requested to report such cases in order that steps may be taken to improve the conditions.

20 The "loom" (glow) of a powerful light is often seen beyond the limit of visibility of the actual rays of the light. The loom may sometimes appear sufficiently sharp enough to obtain a bearing. At short distances, some flashing lights may show a faint continuous light between flashes.

25 The distance of an observer from a light cannot be estimated by its apparent intensity. Always check the characteristics of lights so powerful lights, visible in the distance, are not mistaken for nearby lights (such as those on lighted buoys) showing similar characteristics of low intensity. If lights are not sighted within a reasonable time after prediction, a dangerous situation may exist requiring prompt resolution or action in order to ensure the safety of the vessel.

40 The apparent characteristic of a complex light may change with the distance of the observer. For example, a light which actually displays a characteristic of fixed white varied by flashes of alternating white and red (the rhythms having a decreasing range of visibility in the order: flashing white, flashing red, fixed white) may, when first sighted in clear weather, show as a simple flashing white light. As the vessel draws nearer, the red flash will become visible and the characteristics will apparently be alternating flashing white and red. Later, the fixed white light will be seen between the flashes and the true characteristic of the light will finally be recognized as fixed white, alternating flashing white and red (F W Al WR).

55 If a vessel has considerable vertical motion due to pitching in heavy seas, a light sighted on the horizon may alternately appear and disappear. This may lead the unwary to assign a false characteristic and hence, to err in its identification. The true characteristic will be evident after the distance has been sufficiently decreased or by increasing the height of eye of the observer.

65 Similarly, the effects of wave motion on lighted buoys may produce the appearance of incorrect light phase characteristics when certain flashes occur, but are not viewed by the mariner. In addition, buoy motion can reduce the distance at which buoy lights are detected.

70 **Sectors** of colored glass are placed in the lanterns of some lights in order to produce a system of light sectors of different colors. In general, red sectors are used to mark shoals or to warn the mariner of other obstructions to navigation or of nearby land. Such lights provide approximate bearing information, since observers may note the change of color as they cross the boundary between sectors. These boundaries are indicated in the Light List (Col. 7) and by dotted lines on charts. These bearings, as all bearings referring to lights, are given in true degrees from 000° to 359°, as observed from a vessel toward the light.

90 Altering course on the changing sectors of a light or using the boundaries between light sectors to determine the bearing for any purpose is not recommended. Be guided instead by the correct compass bearing to the light and do not rely on being able to accurately observe the point at which the color changes. This is difficult to determine because the edges of a colored sector cannot be cut off sharply. On either side of the line of demarcation between white, red, or green sectors, there is always a small arc of uncertain color. Moreover, when haze or smoke are present in the intervening atmosphere, a white sector might have a reddish hue.

105 The area in which a light can be observed is normally an arc with the light as the center and the range of visibility as the radius. However, on some bearings the range may be reduced by obstructions. In such cases, the obstructed arc might differ with height of eye and distance. When a light is cut off by adjoining land and the arc of visibility is given, the bearing on which the light disappears may vary with the distance of the vessel from which observed and with the height of eye. When the light is cut off by a sloping hill or point of land, the light may be seen over a wider arc by a vessel farther away than by one closer to the light.

120 The arc drawn on charts around a light is not intended to give information as to the distance at which it can be seen, but solely to indicate, in the case of lights which do not show equally in all directions, the bearings between which the variation of visibility or obstruction of the light occurs.

OIL WELL STRUCTURES

Oil well structures in navigable waters are not listed in the Light List. The structures are shown on the appropriate nautical charts. Information concerning the location and characteristics of those structures which display lights and sound signals not located in obstruction areas are published in Local and/or Weekly Notices to Mariners.

In general, during the nighttime, a series of white lights are displayed extending from the platform to the top of the derrick when drilling operations are in progress. At other times, structures are usually marked with one or more fixed or quick flashing white or red lights, visible for at least one nautical mile during clear weather. Obstructions which are a part of the appurtenances to the main structure, such as mooring piles, anchor and mooring buoys, etc., normally are not lighted. In addition, some of the structures are equipped with sound signals (bell, siren, whistle, or horn). When operating, bells sound one stroke every 15 seconds, while sirens, whistles, or horns sound a single two-second blast every 20 seconds.

CHARACTERISTICS OF AIDS TO NAVIGATION

LIGHT COLORS

Only aids to navigation with green or red lights have lateral significance. When proceeding in the conventional direction of buoyage, the mariner in IALA Region B, may see the following lighted aids to navigation:

Green lights on aids to navigation mark port sides of channels and locations of wrecks or obstructions which must be passed by keeping these lighted aids to navigation on the port hand of a vessel. Green lights are also used on preferred channel marks where the preferred channel is to starboard (i.e., aid to navigation

left to port when proceeding in the conventional direction of buoyage).

Red lights on aids to navigation mark starboard sides of channels and locations of wrecks or obstructions which must be passed by keeping these lighted aids to navigation on the starboard hand of a vessel. Red lights are also used on preferred

channel marks where the preferred channel is to port (i.e., aid to navigation left to starboard when proceeding in the conventional direction of buoyage).

White and yellow lights have no lateral significance. The purpose of aids to navigation exhibiting white or yellow lights may be determined by the shapes, colors, letters, and light rhythms.

Most aids to navigation are fitted with retroreflective material to increase their visibility in darkness. Red or green retroreflective material is used on lateral aids to navigation which, if lighted, will display lights of the same color.

LIGHT RHYTHMS

Light rhythms have no lateral significance. Aids to navigation with lateral significance exhibit flashing, quick, occulting or isophase light rhythms. Ordinarily, flashing lights (frequency not exceeding 30 flashes per minute) will be used.

Preferred channel marks exhibit a composite group-flashing light rhythm of two flashes followed by a single flash.

Safe water marks show a white Morse code "A" rhythm (a short flash followed by a long flash).







Isolated danger marks show a white flashing (2) rhythm (two flashes repeated regularly).

Special marks show yellow lights and exhibit a flashing or fixed rhythm; however, a flashing rhythm is preferred.







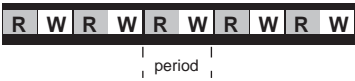
Information and regulatory marks, when lighted, display a white light with any light rhythm except quick flashing, flashing (2) and Morse code "A".

For situations where lights require a distinct cautionary significance, as at sharp turns, sudden channel constrictions, wrecks or obstructions, a quick flashing light rhythm will be used.

CHARACTERISTICS OF LIGHTS

Illustration	Type Description	Abbreviation
	1. Fixed. A light showing continuously and steadily.	F
	2. Occulting. A light in which the total duration of light in a period is longer than the total duration of darkness and the intervals of darkness (eclipses) are usually of equal duration.	
	2.1 Single-occulting. An occulting light in which an eclipse is regularly repeated.	Oc
	2.2 Group-occulting. An occulting light in which a group of eclipses, specified in numbers, is regularly repeated.	Oc (2)
	2.3 Composite group-occulting. A light, similar to a group-occulting light, except that successive groups in a period have different numbers of eclipses.	Oc (2+1)
	3. Isophase. A light in which all durations of light and darkness are equal.	Iso
	4. Flashing. A light in which the total duration of light in a period is shorter than the total duration of darkness and the appearances of light (flashes) are usually of equal duration.	
	4.1 Single-flashing. A flashing light in which a flash is regularly repeated (frequency not exceeding 30 flashes per minute).	Fl

CHARACTERISTICS OF LIGHTS (continued)

Illustration	Type Description	Abbreviation
	4.2 Group-flashing. A flashing light in which a group of flashes, specified in number, is regularly repeated.	FI (2)
	4.3 Composite group-flashing. A light similar to a group flashing light except that successive groups in the period have different numbers of flashes.	FI (2+1)
	5. Quick. A light in which flashes are produced at a rate of 60 flashes per minute.	
	5.1 Continuous quick. A quick light in which a flash is regularly repeated.	Q
	5.2 Interrupted quick. A quick light in which the sequence of flashes is interrupted by regularly repeated eclipses of constant and long duration.	IQ
	6. MORSE CODE. A light in which appearances of light of two clearly different durations (dots and dashes) are grouped to represent a character or characters in the Morse code.	Mo (A)
	7. Fixed and flashing. A light in which a fixed light is combined with a flashing light of higher luminous intensity.	FFI
	8. ALTERNATING. A light showing different colors alternately	AI RW

SHAPES

In order to provide easy identification, certain unlighted buoys and dayboards on beacons are differentiated by shape. These shapes are laterally significant only when associated with laterally significant colors.

Cylindrical buoys (referred to as "can buoys") and square dayboards mark the left side of a channel when proceeding from seaward. These aids to navigation are associated with solid green or green and red banded marks where the topmost band is green.

Conical buoys (referred to as "nun buoys") and triangular dayboards mark the right side of the channel when proceeding from seaward. These aids to navigation are associated with solid red or red and green banded marks where the topmost band is red.

Unless fitted with topmarks; lighted, sound, pillar, and spar buoys have no shape significance. Their meanings are conveyed by their numbers, colors, and light characteristics.

NUMBERS

All solid red and solid green aids to navigation are numbered, with red aids to navigation bearing even numbers and green aids to navigation bearing odd numbers. The numbers for each increase from seaward, proceeding in the conventional direction of buoyage. Numbers are kept in approximate sequence on both sides of the channel by omitting numbers where necessary.

Letters may be used to augment numbers when lateral aids to navigation are added to channels with previously completed numerical sequences. Letters will increase in alphabetical order from seaward, proceeding in the conventional direction of buoyage and are added to numbers as suffixes.

No other aids to navigation are numbered. Preferred channel, safe water, isolated danger, special marks, and information and regulatory aids to navigation may be lettered, but not numbered.

DAYBOARDS

In order to describe the appearance and purpose of each dayboard used in the U.S. System, standard designations have been formulated. A brief explanation of the designations and of the purpose of each type of dayboard in the system is given below, followed by a verbal description of the appearance of each dayboard type.

Designations:

1. First Letter - Shape or Purpose

S: Square used to mark the port (left) side of channels when proceeding from seaward.

T: Triangle used to mark the starboard (right) side of channels when proceeding from seaward.

J: Junction (square or triangle) used to mark (preferred channel) junctions or bifurcations in the channel, or wrecks or obstructions which may be passed on either side; color of top band has lateral significance for the preferred channel.

M: Safe water (octagonal) used to mark the fairway or middle of the channel.

C: Crossing (western rivers only) diamond-shaped, used to indicate the points at which the channel crosses the river.

K: Range (rectangular) when both the front and rear range dayboards are aligned on the same bearing, the observer is on the azimuth of the range, usually used to mark the center of the channel.

N: No lateral significance (diamond or rectangular-shaped) used for special purpose, warning, distance, or location markers.

2. Second letter - Key color

G - Green	R - Red
B - Black	W - White
Y - Yellow	

3. Third letter (color of center stripe; range dayboards only)

4. Additional information after a (-)

-I: Intracoastal Waterway; a yellow reflective horizontal strip on a dayboard; indicates the aid to navigation marks the Intracoastal Waterway.

-SY: Intracoastal Waterway; a yellow reflective square on a dayboard; indicates the aid to navigation is a port hand mark for vessels traversing the Intracoastal Waterway. May appear on a triangular daymark where the Intracoastal Waterway coincides with a waterway having opposite conventional direction of buoyage.

5 -TY: Intracoastal Waterway; a yellow reflective triangle on a dayboard; indicates the aid to navigation is a starboard hand mark for vessels traversing the Intracoastal Waterway. May appear
10 on a square daymark where the Intracoastal Waterway coincides with a waterway having opposite conventional direction of buoyage.

Example: The designation KRW-I indicates a range dayboard (K); key color red (R); with a white stripe (W); in the Intracoastal Waterway (-I).

Descriptions:

20 SG: Square green dayboard with a green reflective border.

SG-I: Square green dayboard with a green reflective border and a yellow reflective horizontal strip.

25 SG-SY: Square green dayboard with a green reflective border and a yellow reflective square.

SG-TY: Square green dayboard with a green reflective border and a yellow reflective triangle.

30 SR: Square red dayboard with a red reflective border. (IALA Region "A")

TG: Triangular green dayboard with a green reflective border. (IALA Region "A")

35 TR: Triangular red dayboard with a red reflective border.

TR-I: Triangular red dayboard with a red reflective border and a yellow reflective horizontal strip.

40 TR-SY: Triangular red dayboard with a red reflective border and a yellow reflective square.

TR-TY: Triangular red dayboard with a red reflective border and a yellow reflective triangle.

45 JG: Dayboard bearing horizontal bands of green and red, green band topmost, with a green reflective border.

50 JG-I: Square dayboard bearing horizontal bands of green and red, green band topmost, with a green reflective border and a yellow reflective horizontal strip.

55 JG-SY: Square dayboard bearing horizontal bands of green and red, green band topmost, with a green reflective border and a yellow reflective square.

JG-TY: Square dayboard bearing horizontal bands of green and red, green band topmost, with a green reflective border and a yellow reflective triangle.

60 JR: Dayboard bearing horizontal bands of red and green, red band topmost, with a red reflective border.

65 JR-I: Triangular dayboard bearing horizontal bands of red and green, red band topmost, with a red reflective border and a yellow horizontal strip.

70 JR-SY: Triangular dayboard bearing horizontal bands of red and green, red band topmost, with a red reflective border and a yellow reflective square.

JR-TY: Triangular dayboard bearing horizontal bands of red and green, red band topmost, with a red reflective border and a yellow reflective triangle.

75 MR: Octagonal dayboard bearing stripes of white and red, with a white reflective border.

80 MR-I: Octagonal dayboard bearing stripes of white and red, with a white reflective border and a yellow reflective horizontal strip.

85 CG: Diamond-shaped dayboard divided into four diamond-shaped colored sectors with the sectors at the side corners white and the sectors at the top and bottom corners green, with a white reflective border.

90 CR: Diamond-shaped dayboard divided into four diamond-shaped colored sectors with the sectors at the side corners white and the sectors at the top and bottom corners red, with a white reflective border.

KBG: Rectangular black dayboard bearing a central green stripe.

95 KBG-I: Rectangular black dayboard bearing a central green stripe and a yellow reflective horizontal strip.

KBR: Rectangular black dayboard bearing a central red stripe.

100 KBR-I: Rectangular black dayboard bearing a central red stripe and a yellow reflective horizontal strip.

KBW: Rectangular black dayboard bearing a central white stripe.

105 KBW-I: Rectangular black dayboard bearing a central white stripe and a yellow reflective horizontal strip.

5 KGB: Rectangular green dayboard bearing a central black stripe.

KGB-I: Rectangular green dayboard bearing a central black stripe and a yellow reflective horizontal strip.

10 KGR: Rectangular green dayboard bearing a central red stripe.

KGR-I: Rectangular green dayboard bearing a central red stripe and a yellow reflective horizontal strip.

15 KGW: Rectangular green dayboard bearing a central white stripe.

KGW-I: Rectangular green dayboard bearing a central white stripe and a yellow reflective horizontal strip.

20 KRB: Rectangular red dayboard bearing a central black stripe.

KRB-I: Rectangular red dayboard bearing a central black stripe and a yellow reflective horizontal strip.

25 KRG: Rectangular red dayboard bearing a central green stripe.

KRG-I: Rectangular red dayboard bearing a central green stripe and a yellow reflective horizontal strip.

30 KRW: Rectangular red dayboard bearing a central white stripe.

KRW-I: Rectangular red dayboard bearing a central white stripe and a yellow reflective horizontal strip.

35 KWB: Rectangular white dayboard bearing a central black stripe.

KWB-I: Rectangular white dayboard bearing a central black stripe and a yellow reflective horizontal strip.

40 KWG: Rectangular white dayboard bearing a central green stripe.

KWG: Rectangular white dayboard bearing a central green stripe. KWG-I: Rectangular white dayboard bearing a central green stripe and a yellow reflective horizontal strip.

KWR: Rectangular white dayboard bearing a central red stripe.

50 KWR-I: Rectangular white dayboard bearing a central red stripe and a yellow reflective horizontal strip.

55 NB: Diamond-shaped dayboard divided into four diamond-shaped colored sectors with the sectors at the side corners white and the sectors at the top and bottom corners black, with a white reflective border.

60 NG: Diamond-shaped dayboard divided into four diamond-shaped colored sectors with the sectors at the side corners white and the sectors at the top and bottom corners green, with a white reflective border.

65 NR: Diamond-shaped dayboard divided into four diamond-shaped colored sectors with the sectors at the side corners white and the sectors at the top and bottom corners red, with a white reflective border.

70 NW: Diamond-shaped white dayboard with an orange reflective border and black letters describing the information or regulatory nature of the mark.

ND: Rectangular white mileage marker with black numerals indicating the mile number (western rivers only).

75 NL: Rectangular white location marker with an orange reflective border and black letters indicating the location.

NY: Diamond-shaped yellow dayboard with yellow reflective border.

80 These abbreviated descriptions are used in column (6) and may also be found on the illustration of U.S. Aids to Navigation System.

5 OTHER SHORT RANGE AIDS TO NAVIGATION

Lighthouses are placed on shore or on marine sites and most often do not show lateral markings. They assist the mariner in determining his position or safe course, or warn of obstructions or dangers to navigation. Lighthouses with no lateral significance usually exhibit a white light.

Occasionally, lighthouses use sectored lights to mark shoals or warn mariners of other dangers. Lights so equipped show one color from most directions and a different color or colors over definite arcs of the horizon as indicated on the appropriate nautical chart. These sectors provide approximate bearing information and the observer should note a change of color as the boundary between the sectors is crossed. Since sector bearings are not precise, they should be considered as a warning only, and used in conjunction with a nautical chart.

Seasonal aids to navigation are placed into service or changed at specified times of the year. The dates shown in the Light List (Col. 7) are approximate and may vary due to adverse weather or other conditions.

Ranges are non-lateral aids to navigation systems employing dual beacons which when the structures appear to be in line, assist the mariner in maintaining a safe course. The appropriate nautical chart must be consulted when using ranges to determine whether the range marks the centerline of the navigable channel and also what section of the range may be safely traversed. Ranges display rectangular dayboards of various colors and are generally, but not always lighted. When lighted, ranges may display lights of any color.

Sound signal is a generic term used to describe aids to navigation that produce an audible signal designed to assist the mariner in fog or other periods of reduced visibility. These aids to navigation can be activated by several means (e.g., manually, remotely, or fog detector). In cases where a fog detector is in use, there may be a delay in the automatic activation of the signal. Additionally, fog detectors may not be capable of detecting patchy fog conditions. Sound signals are distinguished by their tone and phase characteristics.

Tones are determined by the devices producing the sound, e.g., diaphones, diaphragm horns, sirens, whistles, bells, and gongs.

Phase characteristics are defined by the signal's sound pattern, i.e., the number of blasts and silent periods per minute and their durations. Sound signals sounded from fixed structures generally produce a specific number of blasts and silent periods each minute when operating. Buoy sound signals are generally activated by the motion of the sea and therefore do not emit a regular signal characteristic. It is common, in fact, for a buoy to produce no sound signal when seas are calm. Mariners are reminded that buoy positions are not always reliable.

The characteristic of a sound signal can be located in column (7) of the Light List. Unless it is specifically stated that a sound signal "Operates continuously", or the signal is a bell, gong, or whistle on a buoy, it can be assumed that the sound signal only operates during times of fog, reduced visibility, or adverse weather.

An emergency sound signal is sounded at some locations when the main and standby signals are inoperative. If the emergency signal is of a different type or characteristic than the main signal, its characteristic is listed in column (7) of this publication.

CAUTION: Mariners should not rely on sound signals to determine their position. Distance cannot be accurately determined by sound intensity. Occasionally, sound signals may not be heard in areas close to their location. Signals may not sound in cases where fog exists close to, but not at, the location of the sound signal.

100 VARIATIONS TO THE U.S. SYSTEM

Intracoastal Waterway aids to navigation: The Intracoastal Waterway runs parallel to the Atlantic and Gulf coasts from Manasquan Inlet, New Jersey to the Mexican border. Aids to navigation marking these waters have some portion of them marked with yellow. Otherwise, the coloring and numbering of the aids to navigation follow the same system as that in other U.S. waterways.

In order that vessels may readily follow the Intracoastal Waterway route, special markings are employed. These marks consist of a yellow square and yellow triangle and indicate which side the aid to navigation should be passed when following the conventional direction of buoyage. The yellow square indicates that the aid to navigation should be kept on the left side and the yellow triangle indicates that the aid to navigation should be kept on the right side.

5 *NOTE:* The conventional direction of buoyage in the Intracoastal Waterway is generally southerly along the Atlantic coast and generally westerly along the Gulf coast.

10 The **Western Rivers System**, a variation of the standard U.S. Aids to Navigation System described in the preceding sections, is employed on the Mississippi River and its tributaries above Baton Rouge, LA and on
15 certain other rivers which flow toward the Gulf of Mexico.

The Western Rivers System varies from the standard U.S. system as follows:

20 1) Aids to navigation are not numbered.

2) Numbers on aids to navigation do not have lateral significance, but rather indicate mileage from a fixed point (normally the river mouth).

25 3) Diamond shaped crossing dayboards, red and white or green and white as appropriate, are used to indicate where the river channel crosses from one bank to the other.

30 4) Lights on green aids to navigation show a single-flash characteristic which may be green or white.

35 5) Lights on red aids to navigation show a group-flash characteristic which may be red or white.

6) Isolated danger marks are not used.

Uniform State Waterway Marking System (USWMS): This system was developed in 1966 to provide an easily understood system for operators of small boats. While designed for use on lakes and other inland waterways that are not portrayed on nautical charts, the USWMS was authorized for use on other waters as well. It supplements the existing Federal marking system and is generally compatible with it.
40
45

The conventional direction of buoyage is considered upstream or towards the head of navigation.

50 The USWMS varies from the standard U.S. system as follows:

1) The color black is used instead of green.

55 2) There are three aids to navigation which reflect cardinal significance:

a. A white buoy with a red top indicates an obstruction and the buoy should be passed to the south or west.

60 b. A white buoy with a black top indicates an obstruction and the buoy should be passed to the north or east.

65 c. A red and white vertically striped buoy indicates that an obstruction exists between that buoy and the nearest shore.

3) Mooring buoys are white buoys with a horizontal blue band midway between the water line and the top of the buoy. This buoy may be lighted and will generally show a slow flashing light.
70

BRIDGE MARKINGS

75 Bridges across navigable waters are generally marked with red, green and/or white lights for nighttime navigation. Red lights mark piers and other parts of the bridge. Red lights are also used on drawbridges to
80 how when they are in the closed position.

Green lights are used on drawbridges to show when they are in the open position. The location of these lights will vary according to the bridge structure. Green
85 lights are also used to mark the centerline of navigable channels through fixed bridges. If there are two or more channels through the bridge, the preferred channel is also marked by three white lights in a
90 vertical line above the green light.

Red and green retroreflective panels may be used to mark bridge piers and may also be used on bridges not required to display lights.

95 Main channels through bridges may be marked by lateral red and green lights and dayboards. Adjacent piers should be marked with fixed yellow lights when the main channel is marked with lateral aids to navigation.
100

Centerlines of channels through fixed bridges may be marked with a safe water mark and an occulting white light when lateral marks are used to mark main channels. The centerline of the navigable channel through the draw span of floating bridges may be marked with a special mark. The mark will be a yellow diamond with yellow retroreflective panels and may exhibit a yellow light that displays a Morse code "B"(-...).
105
110

5 Clearance gauges may be installed to enhance navigation safety. The gauges are located on the right channel pier or pier protective structure facing approaching vessels. They indicate the vertical clearance available under the span.

10 Drawbridges equipped with radiotelephones display a blue and white sign which indicates what VHF radiotelephone channels should be used to request bridge openings.

ELECTRONIC AIDS TO NAVIGATION

RACONS

Aids to navigation may be enhanced by the use of **R**Adar bea**CONS** (RACONS). RACONS, when triggered by pulses from a vessel's radar, will transmit a coded reply to the vessel's radar. This reply serves to identify the RACON station by exhibiting a series of dots and dashes which appear on the radar display emanating radially from the RACON. This display will represent the approximate range and bearing to the RACON. Although RACONS may be used on both laterally significant and non-laterally significant aids to navigation, the RACON signal itself is for identification purposes only, and therefore carries no lateral significance. RACONS are also used as bridge marks to mark the point of best passage.

All RACONS operate in the marine radar X-band from 9,300 to 9,500 MHz. Some frequency-agile RACONS also operate in the 2,900 to 3,000 MHz marine radar S-band.

40 RACONS have a typical output of 100 to 300 milliwatts and are considered a short range aid to navigation. Reception varies from a nominal range of 6 to 8 nautical miles when mounted on a buoy to as much as 17 nautical miles for a RACON with a directional antenna mounted at a height of 50 feet on a fixed structure. It must be understood that these are nominal ranges and are dependent upon many factors.

50 The beginning of the RACON presentation occurs about 50 yards beyond the RACON position and will persist for a number of revolutions of the radar antenna (depending on its rotation rate). Distance to the RACON can be measured to the point at which the RACON flash begins, but the figure obtained will be greater than the ship's distance from the RACON. This is due to the slight response delay in the RACON apparatus.

65 Radar operators may notice some broadening or spoking of the RACON presentation when their vessel approaches closely to the source of the RACON. This effect can be minimized by adjustment of the IF gain or sweep gain control of the radar. If desired, the RACON presentation can be virtually eliminated by operation of the FTC (fast time constant) controls of the radar.

70 Radar Reflectors

Many aids to navigation incorporate special fixtures designed to enhance the reflection of radar energy. These fixtures, called radar reflectors, help radar equipped vessels to detect buoys and beacons which are so equipped. They do not however, positively identify a radar target as an aid to navigation.

LORAN-C

80 LORAN, an acronym for L**On**g R**An**ge N**avi**gation, is an electronic aid to navigation consisting of shore-based radio transmitters. The LORAN system enables users equipped with a LORAN receiver to determine their position quickly and accurately, day or night, in practically any weather.

A LORAN-C chain consists of three to six transmitting stations separated by several hundred miles. Within a chain, one station is designated as master (M) while the other stations are designated as secondary. Each secondary station is identified as either Victor (V), Whiskey (W), X-ray (X), Yankee (Y), or Zulu (Z).

95 The master station is always the first station to transmit. It transmits a series of nine pulses. The secondary stations then follow in turn, transmit eight pulses each, at precisely timed intervals. This cycle continuously repeats itself. The length of the cycle is measured in microseconds and is called a Group Repetition Interval (GRI).

105 LORAN-C chains are designated by the four most significant digits of their GRI. For example, a chain with a GRI of 89,700 microseconds is referred to as 8970. A different GRI is used for each chain because all LORAN-C stations broadcast in the same 90 to 110 kilohertz frequency band and would otherwise interfere with one another.

115 The LORAN-C system can be used in either a hyperbolic or range mode. In the widely used hyperbolic mode, a LORAN-C line of position is determined by measuring the time difference between synchronized

5 pulses received from two separate transmitting stations. In the range mode, a line of position is determined by measuring the time required for LORAN-C pulses to travel from a transmitting station to the user's receiver.

A user's position is determined by locating the crossing point of two lines of position on a LORAN-C chart. Many receivers have built-in coordinate converters that automatically display the receiver's latitude and longitude. With a coordinate converter, a position can be determined using a chart that is not overprinted with LORAN-C lines of position.

20 CAUTION: The latitude/longitude computation in some receivers is based upon an all seawater propagation path. This may lead to error if the LORAN-C signals from the various stations involve appreciable overland propagation paths. These errors may put the mariner at risk in areas requiring precise positioning, if the proper correctors (ASF) are not applied. *Therefore, it is recommended that mariners using Co-ordinate Converters check the manufacturer's operating manual to determine if and how corrections are to be applied to compensate for timing variations caused by the overland paths.*

35 There are two types of LORAN-C accuracy; absolute and repeatable. Absolute accuracy is a measure of the navigator's ability to determine latitude and longitude position from the LORAN-C time differences measured. Repeatable accuracy is a measure of the LORAN-C navigator's ability to return to a position where readings have been taken before.

The absolute accuracy of LORAN-C is 0.25 nautical miles, with 95% confidence within the published coverage area using standard LORAN-C charts and tables. Repeatable accuracy depends on many factors, so measurements must be taken to determine the repeatable accuracy in any given area. Coast Guard surveys have found repeatable accuracy to be between 30 and 170 meters in most ground wave coverage areas.

55 If the timing or pulse shape of a master-secondary pair deviates from specified tolerances, the first two pulses of secondary station's pulse train will blink on and off. The LORAN-C receiver sees this blinking signal and indicates a warning to the user. This warning will continue until the signals are once again in tolerance. A blinking signal is not exhibited during off-air periods,

so a separate receiver alarm indicates any loss of signal. Never use a blinking secondary signal for navigation.

Although LORAN-C signal availability normally exceeds 99.9% and scheduled off-air periods are broadcast to the mariners, LORAN-C should not be relied upon as the only aid to navigation. A prudent navigator will use radar, a radio direction finder, a fathometer and any other aid to navigation, in addition to the LORAN-C receiver.

LORAN-C interference

Interference to LORAN-C may result from radio transmissions by public or private sources operating near the LORAN-C band of 90-110kHz. Anyone observing interference to LORAN-C, should promptly report it to the Coast Guard command listed below. Include, in such reports, information regarding the date, time, identifying characteristics, strength of the interfering signals and your vessel's position. These interference reports are very important and cooperation from users of LORAN-C will assist the Coast Guard in improving LORAN-C service.

Commanding Officer
U.S. Coast Guard
NAVCEN
7323 Telegraph Road
Alexandria, VA 22310-3998

Phone: (703) 313-5900
FAX: (703) 313-5920
Internet: <http://www.navcen.uscg.gov>

LORAN-C Charts and Publications

Navigational charts overprinted with LORAN-C lines of position are published by the National Ocean Service and the National Imagery and Mapping Agency and are sold through National Ocean Service/NOAA. A free catalog of available products can be obtained from NOS by phone: (301) 436-6990/(800) 638-8972; FAX: (301) 436-6829; or mail: National Ocean Service/NOAA, Distribution Division N/ACC3, Riverdale, MD 20737-1199.

GLOBAL POSITIONING SYSTEM (GPS)

The Global Positioning System (GPS) is a satellite-based Radionavigation System providing continuous worldwide coverage. GPS provides navigation, position, and timing information to air, marine, and land users. The GPS System has reached Full Operating Capability (FOC). FOC status signifies that the system meets specific re-

quirements of performance. The GPS is operated and controlled by the Department of Defense (DOD) under U.S. Air Force management.

GPS consists of a constellation of 24 satellites, orbiting Earth in six planes of 4 satellites each, at an altitude of 10,900 nautical miles. The orbit period of each satellite is 12 hours. Mariners can expect 7-9 satellites available for use with unrestricted view of the sky. Fewer satellites will be available in areas where portions of the sky are blocked by mountains, buildings, or vegetation. At least three satellites are required for a two-dimensional solution. On May 1st, 2000, the United States stopped the intentional degradation of GPS Signals known as "Selective Availability" and users can now expect accuracy to within 10 meters. The GPS system does not provide integrity information and mariners should exercise extreme caution when using GPS in restricted waterways.

Although originally intended for military use only, Federal radionavigation policy has established that GPS will be available for civil use. Whenever possible, advance notice of when the GPS satellites should not be used will be provided by the DOD and made available by the U.S. Coast Guard. GPS status messages are available at <http://www.navcen.uscg.gov>.

DIFFERENTIAL GPS (DGPS)

The Coast Guard has implemented a system for marine navigation called Differential GPS (DGPS). As the newest electronic system of navigation, DGPS transmitters provide offshore coverage and an all-weather electronic aid to navigation capability. The Coast Guard DGPS transmitting sites provide coverage to the Great Lakes, and coastal areas of the continental United States as well as selected portions of Alaska, Hawaii, Puerto Rico and the inland river system.

The Coast Guard's DGPS system achieved Full Operational Capability (FOC) on March 15, 1999. The network now meets the high standards of accuracy, integrity, reliability, availability and coverage required for the Harbor Entrance and Approach phase of navigation. As of October 2001, 74 sites were providing differential correction.

The Department of Transportation (DOT) has recognized the benefit of an augmented GPS signal for other public safety applications. In DOT's effort to expand the maritime DGPS signals into a Nationwide

DGPS (NDGPS) network, an additional 10 sites are currently transmitting DGPS corrections. Some of these sites provide wide coverage to navigable waters with the same performance criteria as the Maritime DGPS signal. Where available, these signals are also useable for maritime navigation. The NDGPS network will not be completed for several years.

DGPS is an augmentation to the GPS signals. Each site corrects for small variations in the signals from each satellite that is in view at that time. Satellite signals can vary due to small changes in the satellite's circuitry and orbit and from changes caused by local weather conditions. Satellite corrections are transmitted to users via radio signals in the medium frequency band (285-325 kHz) previously used for marine radiobeacons. DGPS corrections and integrity information are transmitted using Minimum Shift Keying (MSK) modulation; the modulation data rate is usually 100 or 200 bits per second (bps) but can also be 50 bps. The range of DGPS transmissions is from 40 to 300 nautical miles.

DGPS is the first federal radionavigation system capable of providing the 10-meter navigation service required for the harbor entrance and approach phase of maritime navigation. DGPS provides integrity messages for signals from the GPS satellites as well as DGPS position corrections and provides absolute position accuracy of 1-5 meters.

Each DGPS site has two reference stations (which calculate the differential corrections), two integrity monitors (which ensure the differential corrections are accurate), a transmitter and communications equipment to communicate status information to and receive control commands from the control station. Each transmitter and reference station has a unique ID number that permits users to determine which site/equipment is providing their differential corrections. As distance from the transmitting site increases, the small error in the differential corrections increases; best accuracy is achieved when using the DGPS site closest to the user.

Information regarding the location of DGPS transmitters is given on page xxiv. Users can access additional information and DGPS system status, submit questions, and provide comments via the Navigation Information Service website or by calling the Coast Guard Navigation Center watchstander (see below).

NAVIGATION INFORMATION SERVICE (NIS)

The Coast Guard is the government interface for civil users of GPS and has established a Navigation Information Service (NIS) to meet the information needs of the civil user. The NIS is a Coast Guard facility that is manned 24 hours a day, 7 days a week, and is located at the Navigation Center (NAVCEN) in Alexandria, VA. It provides voice broadcasts, data broadcasts, facsimile, and on-line computer-based information services, which are all available 24 hours a day. The information provided includes present or future satellite outages and constellation changes, user instructions and tutorials, lists of service and receiver provider/users, and other GPS, DGPS, and LORAN related information.

NIS Internet Service (www)

Users with access to the World Wide Web (www) can access real time or archived GPS, NDGPS, DGPS and Loran-C information at www.navcen.uscg.mil as well as subscribe to a list server which enables users to receive GPS status messages and Notice to NAVSTAR User (NANU) messages via direct internet e-mail.

The NIS 24 hour voice recording is a 3-line telephone answering machine. Up to 3 callers can listen to the 90 second recording at the same time.

The NIS also disseminates GPS and DGPS safety advisory broadcast messages through USCG broadcast stations utilizing VHF-FM voice, HF-SSB voice, and NAVTEX broadcasts. The broadcasts provide the GPS and DGPS user in the marine environment with the current status of the navigation systems, as well as any planned/unplanned system outages that could affect GPS, DGPS, and LORAN navigational accuracy.

To comment on any of these services or ask questions about the service offered by NIS, contact the NIS at:

Commanding Officer
U.S. Coast Guard
NAVCEN (NIS)
7323 Telegraph Road
Alexandria, VA 22310-3998

Phone: (703) 313-5900
FAX: (703) 313-5920
Internet: <http://www.navcen.uscg.gov>

DIFFERENTIAL GPS SITES - MISSISSIPPI RIVER SYSTEM

Broadcast Site	Freq kHz	Trans Rate (BPS)	Lat. (N) ° ' "	Long. (W) ° ' "	Range (n.m.)	Radiobeacon ID #
ENGLISH TURN, LA	293	200	29 52 42	89 56 30	170	814
VICKSBURG, MS	313	200	32 19 54	90 55 12	115	860
MEMPHIS, TN	310	200	35 27 54	90 12 18	130	861
ST LOUIS, MO	322	200	38 36 42	89 45 30	115	862
ROCK ISLAND, IL	311	200	42 00 18	90 12 07	150	863

GLOSSARY OF AIDS TO NAVIGATION TERMS

5 **Adrift:** Afloat and unattached in any way to the shore or seabed.

Aid to navigation: Any device external to a vessel or aircraft specifically intended to assist navigators in determining their position or safe course, or to warn them of dangers or obstructions to navigation.

Alternating light: A rhythmic light showing light of alternating colors.

15 **Arc of visibility:** The portion of the horizon over which a lighted aid to navigation is visible from seaward.

Articulated beacon: A beacon-like buoyant structure, tethered directly to the seabed and having no watch circle. Called articulated light or articulated daybeacon, as appropriate.

Assigned position: The latitude and longitude position for an aid to navigation.

20 **Beacon:** A lighted or unlighted fixed aid to navigation attached directly to the earth's surface. (Lights and daybeacons both constitute beacons.)

Bearing: The horizontal direction of a line of sight between two objects on the surface of the earth.

30 **Bell:** A sound signal producing bell tones by means of a hammer actuated by electricity on fixed aids and by sea motion on buoys.

35 **Bifurcation:** The point where a channel divides when proceeding from seaward. The place where two tributaries meet.

Broadcast Notice to Mariners: A radio broadcast designed to provide important marine information.

40 **Buoy:** A floating object of defined shape and color, which is anchored at a given position and serves as an aid to navigation.

45 **Characteristic:** The audible, visual, or electronic signal displayed by an aid to navigation to assist in the identification of an aid to navigation. Characteristic refers to lights, sound signals, RACONS, radio-beacons, and daybeacons.

50 **Commissioned:** The action of placing a previously discontinued aid to navigation back in operation.

55 **Composite group-flashing light:** A group-flashing light in which the flashes are combined in successive groups of different numbers of flashes.

Composite group-occulting light: A light similar to a group-occulting light except that the successive groups in a period have different numbers of eclipses.

60 **Conventional direction of buoyage:** The general direction taken by the mariner when approaching a harbor, river, estuary, or other waterway from seaward, or proceeding upstream or in the direction of the main stream of flood tide, or in the direction indicated in appropriate nautical documents (normally, following a clockwise direction around land masses).

70 **Daybeacon:** An unlighted fixed structure which is equipped with a dayboard for daytime identification.

Dayboard: The daytime identifier of an aid to navigation presenting one of several standard shapes (square, triangle, rectangle) and colors (red, green, white, orange, yellow, or black.)

75 **Daymark:** The daytime identifier of an aid to navigation. (See column 6 of the Light List.)

80 **Diaphone:** A sound signal which produces sound by means of a slotted piston moved back and forth by compressed air. A "two-tone" diaphone produces two sequential tones with the second tone of lower pitch.

Directional light: A light illuminating a sector or very narrow angle and intended to mark a direction to be followed.

85 **Discontinued:** To remove from operation (permanently or temporarily) a previously authorized aid to navigation.

Discrepancy: Failure of an aid to navigation to maintain its position or function as prescribed in the Light List.

90 **Discrepancy buoy:** An easily transportable buoy used to temporarily replace an aid to navigation not watching properly.

95 **Dolphin:** A minor aid to navigation structure consisting of a number of piles driven into the seabed or riverbed in a circular pattern and drawn together with wire rope.

Eclipse: An interval of darkness between appearances of a light.

100 **Emergency light:** A light of reduced intensity displayed by certain aids to navigation when the main light is extinguished.

GLOSSARY OF AIDS TO NAVIGATION TERMS

5 **Establish:** To place an authorized aid to navigation in operation for the first time.

Extinguished: A lighted aid to navigation which fails to show a light characteristic.

10 **Fixed light:** A light showing continuously and steadily, as opposed to a rhythmic light. (Do not confuse with "fixed" as used to differentiate from "floating.")

15 **Flash:** A relatively brief appearance of a light, in comparison with the longest interval of darkness in the same character.

Flash tube: An electronically controlled high-intensity discharge lamp with a very brief flash duration.

20 **Flashing light:** A light in which the total duration of light in each period is clearly shorter than the total duration of darkness and in which the flashes of light are all of equal duration. (Commonly used for a single-flashing light which exhibits only single flashes which are repeated at regular intervals.)

Floating aid to navigation: A buoy, secured in its assigned position by a mooring.

30 **Fog detector:** An electronic device used to automatically determine conditions of visibility which warrant the activation of a sound signal or additional light signals.

Fog signal: See sound signal.

35 **Geographic range:** The greatest distance the curvature of the earth permits an object of a given height to be seen from a particular height of eye without regard to luminous intensity or visibility conditions.

40 **Global Positioning System (GPS):** A satellite-based radionavigation system providing continuous worldwide coverage. It provides navigation, position, and timing information to air, marine, and land users.

45 **Gong:** A wave actuated sound signal on buoys which uses a group of saucer-shaped bells to produce different tones.

50 **Group-flashing light:** A flashing light in which a group of flashes, specified in number, is regularly repeated.

Group-occluding light: An occluding light in which a group of eclipses, specified in number, is regularly repeated.

55 **Horn:** A sound signal which uses electricity or compressed air to vibrate a disc diaphragm.

60 **Inoperative:** Sound signal or electronic aid to navigation out of service due to a malfunction.

Interrupted quick light: A quick flashing light in which the rapid alternations are interrupted at regular intervals by eclipses of long duration.

65 **Isolated danger mark:** A mark erected on, or moored above or very near, an isolated danger which has navigable water all around it.

70 **Isophase light:** A rhythmic light in which all durations of light and darkness are equal. (Formerly called equal interval light.)

75 **Junction:** The point where a channel divides when proceeding seaward. The place where a tributary departs from the main stream.

80 **Lateral system:** A system of aids to navigation in which characteristics of buoys and beacons indicate the sides of the channel or route relative to a conventional direction of buoyage (usually upstream).

85 **Light:** The signal emitted by a lighted aid to navigation. The illuminating apparatus used to emit the light signal. A lighted aid to navigation on a fixed structure.

90 **Light sector:** The arc over which a light is visible, described in degrees true, as observed from seaward towards the light. May be used to define distinctive color difference of two adjoining sectors, or an obscured sector.

95 **Lighted ice buoy (LIB):** A lighted buoy without a sound signal, and designed to withstand the forces of shifting and flowing ice. Used to replace a conventional buoy when that aid to navigation is endangered by ice.

Lighthouse: A lighted beacon of major importance.

100 **Local Notice to Mariners:** A written document issued by each U.S. Coast Guard district to disseminate important information affecting aids to navigation, dredging, marine construction, special marine activities, and bridge construction on the waterways within that district.

GLOSSARY OF AIDS TO NAVIGATION TERMS

5 **LORAN:** An acronym for LOnge RAnge Navigation, is an electronic aid to navigation consisting of shore-based radio transmitters. The LORAN system enables users
10 mine their position quickly and accurately, day or night, in practically any weather.

Luminous range: The greatest distance a light can be expected to be seen given its nominal range and the prevailing meteorological visibility.
15

Mark: A visual aid to navigation. Often called navigation mark, includes floating marks (buoys) and fixed marks (beacons).

20 **Meteorological visibility:** The greatest distance at which a black object of suitable dimension could be seen and recognized against the horizon sky by day, or, in the case of night observations, could be seen and recognized if the general illumination
25 were raised to the normal daylight level.

Mileage number: A number assigned to aids to navigation which gives the distance in sailing miles along the river from a reference point to the aid to navigation. The number is used principally in the Mississippi River System.
30

Nominal range: The maximum distance a light can be seen in clear weather (meteorological visibility of 10 nautical miles). Listed for all lighted aids to navigation except range lights, directional lights, and private aids to navigation.
35

Occulting light: A light in which the total duration of light in each period is clearly longer than the total duration of darkness and in which the intervals of darkness (occultations) are all of equal duration. (Commonly used for single-occulting light which exhibits only single occultations which are repeated at regular intervals.)
40 45

Ocean Data Acquisition System (ODAS): Certain very large buoys in deep water for the collection of oceanographic and meteorological information. All ODAS buoys are yellow in color and display a yellow light.
50

Off shore tower: Monitored light stations built on exposed marine sites to replace lightships.

55 **Off station:** A floating aid to navigation not on its assigned position.

Passing light: A low intensity light which may be mounted on the structure of another light to enable the mariner to keep

the latter light in sight when passing out of its beam during transit.
60

Period: The interval of time between the commencement of two identical successive cycles of the characteristic of the light or sound signal.

65 **Pile:** A long, heavy timber driven into the seabed or riverbed to serve as a support for an aid to navigation.

Port hand mark: A buoy or beacon which is left to the port hand when proceeding in the "conventional direction of buoyage".
70

Preferred channel mark: A lateral mark indicating a channel junction or bifurcation, or a wreck or other obstruction which, after consulting a chart, may be passed on either side.
75

Primary aid to navigation: An aid to navigation established for the purpose of making landfalls and coastwise passages from headland to headland.

80 **Quick light:** A light exhibiting very rapid regular alternations of light and darkness, normally 60 flashes per minute. (Formerly called quick flashing light).

RACON: A radar beacon which produces a coded response, or radar paint, when triggered by a radar signal.
85

Radar: An electronic system designed to transmit radio signals and receive reflected images of those signals from a "target" in order to determine the bearing and distance to the "target".
90

Radar reflector: A special fixture fitted to or incorporated into the design of certain aids to navigation to enhance their ability to reflect radar energy. In general, these fixtures will materially improve the aid to navigation for use by vessels with radar.
95

Range: A line formed by the extension of a line connecting two charted points.

100 **Range lights:** Two lights associated to form a range which often, but not necessarily, indicates a channel centerline. The front range light is the lower of the two, and nearer to the mariner using the range. The rear range light is higher and further from the mariner.
105

Rebuilt: A fixed aid to navigation, previously destroyed, which has been restored as an aid to navigation.

GLOSSARY OF AIDS TO NAVIGATION TERMS

5 **Regulatory marks:** A white and orange aid to navigation with no lateral significance. Used to indicate a special meaning to the mariner, such as danger, restricted operations, or exclusion area.

10 **Relighted:** An extinguished aid to navigation returned to its advertised light characteristics.

15 **Replaced:** An aid to navigation previously off station, adrift, or missing, restored by another aid to navigation of the same type and characteristics.

20 **Replaced (temporarily):** An aid to navigation previously off station, adrift, or missing, restored by another aid to navigation of different type and/or characteristic.

Reset: A floating aid to navigation previously off station, adrift, or missing, returned to its assigned position (station).

25 **Rhythmic light:** A light showing intermittently with a regular periodicity.

Sector: See light sector.

Setting a buoy: The act of placing a buoy on assigned position in the water.

30 **Siren:** A sound signal which uses electricity or compressed air to actuate either a disc or a cup-shaped rotor.

35 **Skeleton tower:** A tower, usually of steel, constructed of heavy corner members and various horizontal and diagonal bracing members.

Sound signal: A device which transmits sound, intended to provide information to mariners during periods of restricted visibility and foul weather.

40 **Starboard hand mark:** A buoy or beacon which is left to the starboard hand when proceeding in the conventional direction of buoyage.

45 **Topmark:** One or more relatively small objects of characteristic shape and color placed on an aid to identify its purpose.

50 **Traffic Separation Scheme:** Shipping corridors marked by buoys which separate incoming from outgoing vessels. Improperly called SEA LANES.

Watching properly: An aid to navigation on its assigned position exhibiting the advertised characteristics in all respects.

55 **Whistle:** A wave actuated sound signal on buoys which produces sound by emitting compressed air through a circumferential slot into a cylindrical bell chamber.

60 **Winter marker:** An unlighted buoy without sound signal, used to replace a conventional buoy when that aid to navigation is endangered by ice.

65 **Winter light:** A light which is maintained during those winter months when the regular light is extinguished. It is of lower candlepower than the regular light but usually of the same characteristic.

Withdrawn: The discontinuance of a floating aid to navigation during severe ice conditions or for the winter season.

ABBREVIATIONS USED IN NOTICES TO MARINERS

5 Light characteristics

Fixed	F
Occulting	OC
Group-Occulting	OC(2)
Composite Group-Occulting	OC(2+1)
10 Isophase	ISO
Single-Flashing	FL
Group-Flashing	FL(3)
Composite Group-Flashing	FL(2+1)
Continuous Quick-Flashing	Q
15 Interrupted Quick-Flashing	IQ
Morse Code	MO(A)
Fixed and Flashing	FFL
Alternating	AL
Characteristic	CHAR

20 Colors

Black	B
Blue	BU
Green	G
25 Orange	OR
Red	R
White	W
Yellow	Y

30 Aids to Navigation

Aeronautical Radiobeacon	AERO RBN
Articulated Daybeacon	ART DBN
Articulated Light	ART LT
Destroyed	DESTR
35 Discontinued	DISCONTD
Established	ESTAB
Exposed Location Buoy	ELB
Fog signal station	FOG SIG
Large Navigation Buoy	LNB
40 Light	LT
Light List Number	LLNR
Lighted Bell Buoy	LBB
Lighted Buoy	LB
Lighted Gong Buoy	LGB
45 Lighted Horn Buoy	LHB
Lighted Whistle Buoy	LWB
Ocean Data Acquisition System	ODAS
Privately Maintained	PRIV MAINTD
Radar responder beacon	RACON
50 Radar Reflector	RA REF
Temporarily replaced by unlighted buoy	TRUB
Temporarily replaced by lighted buoy	TRLB
Whistle	WHIS

Organizations

Coast Guard	CG
60 Commander, Coast Guard	
District (#)	CCGD(#)
U S Army Corps of Engineers	COE
National Imagery and Mapping Agency	NIMA
65 National Ocean Service	NOS
National Weather Service	NWS

Vessels

Aircraft	A/C
70 Fishing Vessel	F/V
Liquefied Natural Gas Carrier	LNG
Motor Vessel	M/V ¹
Pleasure Craft	P/C
Research Vessel	R/V
75 Sailing Vessel	S/V

Compass Directions

East	E
North	N
80 Northeast	NE
Northwest	NW
South	S
Southeast	SE
Southwest	SW
85 West	W

Months

January	JAN
February	FEB
90 March	MAR
April	APR
May	MAY
June	JUN
July	JUL
95 August	AUG
September	SEP
October	OCT
November	NOV
100 December	DEC

Days of the Week

Monday	MON
Tuesday	TUE
Wednesday	WED
105 Thursday	THU
Friday	FRI
Saturday	SAT
Sunday	SUN

¹ M/V includes: Steam Ship, Container Vessel, Cargo Vessel, etc.

ABBREVIATIONS USED IN NOTICES TO MARINERS

5	Various		Publication	PUB
	Anchorage	ANCH	60 Range	RGE
	Anchorage prohibited	ANCH PROHIB	Reported	REP
	Approximate	APPROX	Restricted	RESTR
	Atlantic	ATLC	Rock	RK
10	Authorized	AUTH	Saint	ST
	Average	AVG	65 Second (time; geo pos)	SEC
	Bearing	BRG	Signal station	SIG STA
	Breakwater	BKW	Station	STA
	Broadcast Notice to Mariners	BNM	Statute Mile(s)	SM
15	Channel	CHAN	Storm signal station	S SIG STA
	Code of Federal Regulations	CFR	70 Temporary	TEMP
	Continue	CONT	Through	THRU
	Degrees (temperature; geo pos)	DEG	Thunderstorm	TSTM
	Diameter	DIA	True	T
20	Edition	ED	Uncovers; Dries	UNCOV
	Effect/Effective	EFF	75 Universal Coordinate Time	UTC
	Entrance	ENTR	Urgent Marine Information Broadcast	UMIB
	Explosive Anchorage	EXPLOS ANCH	Velocity	VLCTY
	Fathom(s)	FM(S)	Vertical clearance	VERT CL
25	Foot/Feet	FT	Visibility	VSBY
	Harbor	HBR	80 Warning	WRNG
	Height	HT	Weather	WEA
	Hertz	HZ	Wreck	WK
	Horizontal clearance	HOR CL	Yard(s)	YD
30	Hour	HR		
	International Regulations for Preventing		85 <u>Countries and States</u>	
	Collisions at Sea, 1972	COLREGS	Alabama	AL
	Kilohertz	KHZ	Alaska	AK
	Kilometer	KM	American Samoa	AS
35	Knot(s)	KT(S)	Arizona	AZ
	Latitude	LAT	90 Arkansas	AR
	Local Notice to Mariners	LNM	California	CA
	Longitude	LONG	Canada	CN
	Maintained	MAINTD	Colorado	CO
40	Maximum	MAX	Connecticut	CT
	Megahertz	MHZ	95 Delaware	DE
	Millibar	MB	District of Columbia	DC
	Millimeter	MM	Federated States of Micronesia	FSM
	Minute (time; geo pos)	MIN	Florida	FL
45	Moderate	MDT	Georgia	GA
	Mountain, Mount	MT	100 Guam	GU
	Nautical Mile(s)	NM	Hawaii	HI
	Notice to Mariners	NTM	Idaho	ID
	Obstruction	OBSTR	Illinois	IL
50	Occasion/Occasionally	OCCASION	Indiana	IN
	Operating Area	OPAREA	105 Iowa	IA
	Pacific	PAC	Kansas	KS
	Point(s)	PT(S)	Kentucky	KY
	Position	PSN	Louisiana	LA
55	Position Approximate	PA	Maine	ME
	Pressure	PRES	110 Maryland	MD
	Private, Privately	PRIV	Massachusetts	MA
	Prohibited	PROHIB	Mexico	MX

ABBREVIATIONS USED IN NOTICES TO MARINERS

5	Michigan	MI	Pennsylvania	PA
	Minnesota	MN	Puerto Rico	PR
	Mississippi	MS	Rhode Island	RI
	Missouri	MO	25 South Carolina	SC
	Montana	MT	South Dakota	SD
10	Nebraska	NE	Tennessee	TN
	New Hampshire	NH	Texas	TX
	Nevada	NV	United States	US
	New Jersey	NJ	30 Utah	UT
	New Mexico	NM	Vermont	VT
15	New York	NY	Virgin Islands	VI
	North Carolina	NC	Virginia	VA
	North Dakota	ND	Washington	WA
	Northern Marianas	CM	35 West Virginia	WV
	Ohio	OH	Wisconsin	WI
20	Oklahoma	OK	Wyoming	WY
	Oregon	OR		

GEOGRAPHIC RANGE TABLE

The following table gives the approximate geographic range of visibility for an object which may be seen by an observer at sea level. It is necessary to add to the distance for the height of any object the distance corresponding to the height of the observer's eye above sea level.

<u>Height</u> Ft/M	<u>Distance</u> SM/NM	<u>Height</u> Ft/M	<u>Distance</u> SM/NM	<u>Height</u> Ft/M	<u>Distance</u> SM/NM
5/1.5	3.0/2.6	70/21.3	11.3/9.8	250/76.2	21.3/18.5
10/3.1	4.3/3.7	75/22.9	11.7/10.1	300/91.4	23.3/20.3
15/4.6	5.2/4.5	80/24.4	12.0/10.5	350/106.7	25.2/21.9
20/6.1	6.0/5.2	85/25.9	12.4/10.8	400/121.9	26.9/23.4
25/7.6	6.7/5.9	90/27.4	12.8/11.1	450/137.2	28.6/24.8
30/9.1	7.4/6.4	95/29.0	13.1/11.4	500/152.4	30.1/26.2
35/10.7	8.0/6.9	100/30.5	13.5/11.7	550/167.6	31.6/27.4
40/12.2	8.5/7.4	110/33.5	14.1/12.3	600/182.9	33.0/28.7
45/13.7	9.0/7.8	120/36.6	14.7/12.8	650/198.1	34.3/29.8
50/15.2	9.5/8.3	130/39.6	15.4/13.3	700/213.4	35.6/31.0
55/16.8	10.0/8.7	140/42.7	15.9/13.8	800/243.8	38.1/33.1
60/18.3	10.4/9.1	150/45.7	16.5/14.3	900/274.3	40.4/35.1
65/19.8	10.9/9.4	200/61.0	19.0/16.5	1000/304.8	42.6/37.0

Example: Determine the geographic visibility of an object, with a height above water of 65 feet, for an observer with a height of eye of 35 feet. Enter above table;

Height of object 65 feet = 10.9 SM
 Height of observer 35 feet = 8.0 SM
 Computed geographic visibility 18.9 SM

COAST GUARD COMMUNICATIONS FACILITIES

NOTE: All Broadcasts are made on Channel 22 (157.1 MHz)

FACILITY	COVERAGE AREA	RIVER STAGES AND SCHEDULED BROADCAST TIMES	CONSOLIDATED BROADCAST TIMES
GROUP UPPER MISSISSIPPI RIVER KEOKUK, IA	UPPER MISSISSIPPI, ILLINOIS, MISSOURI RIVERS AND TRIBUTARIES	2:00 PM & 8:00 PM	2:00 AM & 7:00 AM
GROUP LOWER MISSISSIPPI RIVER MEMPHIS, TN	LOWER MISSISSIPPI (South of Cairo to Baton Rouge), ARKANSAS, OUACHITA-BLACK, RED RIVERS AND TRIBUTARIES	1:00 PM & 7:00 PM	1:00 AM & 8:00 AM
GROUP OHIO VALLEY LOUISVILLE, KY	OHIO, UPPER MISSISSIPPI RIVER, LOWER MISSISSIPPI RIVER AND TRIBUTARIES	12:00 PM 11:00 PM only <i>Scheduled Broadcast</i> The 11:00 PM broadcast is preceded by Tennessee River and tributaries <i>Scheduled Broadcasts</i> .	5:00 PM & 5:00 AM The 5:00 PM broadcast is followed by Tennessee River and tributaries <i>Consolidated Broadcasts</i> . The 5:00 AM broadcast is preceded by Tennessee River and tributaries <i>Consolidated Broadcasts</i> .
	TENNESSEE, CUMBERLAND RIVERS AND TRIBUTARIES	12:00 PM 11:00 PM only <i>Scheduled Broadcast</i> The 11:00 PM broadcast is followed by Ohio River and tributaries <i>Scheduled Broadcasts</i> .	5:00 PM & 5:00 AM The 5:00 PM broadcast is preceded by Ohio River and tributaries <i>Consolidated Broadcasts</i> . The 5:00 AM broadcast is followed by Ohio River and tributaries <i>Consolidated Broadcasts</i> .
NOTE: Broadcast times refer to scheduled Broadcasts in local time. Non-scheduled Broadcasts are made whenever important marine information needs to be passed. Announcements of Broadcasts are made on Channel 16 (156.8 MHz).			

AREAS OF JURISDICTION OF COAST GUARD CUTTERS ON THE MISSISSIPPI AND WESTERN RIVERS

For the guidance and assistance of those persons needing to contact Coast Guard Cutters in areas of jurisdiction are shown below:

FACILITY	ADDRESS	PHONE	AREA
ALLEGHENY RIVER CGC OSAGE (WLR 65505)	Foot of McKnown Lane Sewickley, PA 15143-2093	412-741-1180	Mile 0.0 - 72.0
ARKANSAS WATERWAY - (White River) CGC KANAWHA (WLR 75407)	P.O. Box 7627 Pine Bluff, AR 71611-7627	870-536-2604	Mile 0.0 – 71.2
CGC MUSKINGUM (WLR 75402)	P.O. Box 626 Sallisaw, OK 74955-0626	918-775-4471	Mile 10.3 - 445.9 Lake Texoma
ATCHAFAYALA RIVER CGC GREENBRIER (WLR 75501)	P.O. Box 1090 Vidalia, LA 71373-1343	601-442-1771	Mile 0.0 - 40.0

**AREAS OF JURISDICTION OF COAST GUARD CUTTERS
ON THE MISSISSIPPI AND WESTERN RIVERS (Continued)**

FACILITY	ADDRESS	PHONE	AREA
BIG SANDY RIVER (West Virginia) CGC OBION (WLR 65503)	201 Coast Guard Lane Owensboro, KY 42303-0277	270-685-0658	Mile 0.0 - 7.9
CLINCH RIVER CGC OUACHITA (WLR 65501)	Foot of Old Harrison Pike E. Chattanooga, TN 37416-2825	615-622-2101	Mile 0.0 - 61.5
CUMBERLAND RIVER CGC CHIPPEWA (WLR 75404)	201 Coast Guard Lane Owensboro, KY 42301-0277	270-683-7068	Mile 0.0 - 381.0
GREEN RIVER CGC CHIPPEWA (WLR 75404)	201 Coast Guard Lane Owensboro, KY 42301-0277	502-684-4765	Mile 0.0 - 100.0
HIWASSEE RIVER CGC OUACHITA (WLR 65501)	Foot of Old Harrison Pike E. Chattanooga, TN 37416-2825	615-622-2101	Mile 0.0 - 20.4
ILLINOIS RIVER CGC SANGAMON (WLR 65506)	Foot of Washington Street East Peoria, IL 61611-2039	309-671-7291	Mile 0.0 - 291.1
KANAWHA RIVER CGC OSAGE (WLR 65505)	Foot of McKnown Lane Sewickley, PA 15143-2093	412-741-1180	Mile 0.0 - 89.6
LOWER MISSISSIPPI RIVER CGC GREENBRIER (WLR 75501)	440 L.E. Berry Rd. Natchez, LA 39120	601-446-5104	Mile 233.9 - 363.3
CGC KICKAPOO (WLR 75406)	P.O. Box 31 Vicksburg, MS 39180-0031	601-636-8304	Mile 363.3 - 480.1
CGC PATOKA (WLR 75408)	P.O. Box 468 Greenville, MS 38701-0468	601-332-1060	Mile 480.1 - 598.1
CGC KANAWHA (WLR 75407)	P.O. Box 7627 Pine Bluff, AR 71611-7627	870-536-1134	Mile 598.1 - 712.9
CGC KANKAKEE (WLR 75500)	2 Auction Avenue Memphis, TN 38105-1502	901-544-3987	Mile 683.0 - 813.0
CGC CHENA (WLR 75409)	P.O. Box 299 Hickman, KY 42050-0299	502-236-2324	Mile 833.6 - 955.8
MINNESOTA RIVER CGC WYACONDA (WLR 75403)	60 E. First Street Dubuque, IA 52001-7652	319-582-1965	Mile 0.0 - 12.8
MISSOURI RIVER CGC CHEYENNE (WLR 75405)	Foot of Iron Street St. Louis, MO 63111-2536	314-481-6750	Mile 0.0 - 346.0
CGC GASCONADE (WLR 75401)	P.O. Box 12337 Omaha, NE 68112-0337	402-451-7681	Mile 226.4 - 732.3

**AREAS OF JURISDICTION OF COAST GUARD CUTTERS
ON THE MISSISSIPPI AND WESTERN RIVERS (Continued)**

FACILITY	ADDRESS	PHONE	AREA
MONONGAHELA RIVER CGC OSAGE (WLR 65505)	Foot of McKnown Lane Sewickley, PA 15143-2093	412-741-1180	Mile 0.0 - 128.7
OHIO RIVER CGC OSAGE (WLR 65505)	Foot of McKnown Lane Sewickley, PA 15143-2093	412-741-1180	Mile 0.0 – 277.0
CGC OBION (WLR 65503)	201 Coast Guard Lane Owensboro, KY 42301-0277	270-685-0658	Mile 279.0 – 754.0
CGC CHIPPEWA (WLR 75404)	201 Coast Guard Lane Owensboro, KY 42301-0277	270-683-7068	Mile 754.0 – 919.0
CGC CHENA (WLR 75409)	P.O. Box 299 Hickman, KY 42050-0299	270-236-2324	Mile 918.5 - 981.0
OLD RIVER CGC GREENBRIER (WLR 75501)	P.O. Box 1090 Vidalia, LA 71373-1090	601-442-1771	Mile 0.0 - 6.9
OUACHITA-BLACK WATERWAY CGC GREENBRIER (WLR 75501)	P.O. Box 1090 Vidalia, LA 71373-1090	601-442-1771	Black River Mile 0.0 - 41.5 Ouachita River Mile 41.5 - 337.1
RED RIVER CGC GREENBRIER (WLR 75501)	P.O. Box 1090 Vidalia, LA 71373-1090	601-442-1771	Mile 6.9 - 259.8
ST. CROIX RIVER CGC WYACONDA (WLR 75403)	60 E. First Street Dubuque, IA 52001-7652	319-582-1965	Mile 0.0 – 24.0
TENNESSEE RIVER CGC CIMARRON (WLR 65502)	700 Coast Guard Rd. Buchanan, TN 38222-9801	901-642-4457	Mile 0.0 - 206.7
CGC OUACHITA (WLR 65501)	Foot of Old Harrison Pike E. Chattanooga, TN 37416-2825	423-622-2101	Mile 66.0 - 652.0
TENNESSEE - TOMBIGBEE WATERWAY CGC OUACHITA (WLR 65501)	Foot of Old Harrison Pike E. Chattanooga, TN 37416-2825	423-622-2101	Mile 412.0 – 451.0
UPPER MISSISSIPPI RIVER CGC CHIPPEWA (WLR 75404)	201 Coast Guard Lane Owensboro, KY 42301-0277	270-683-7068	Mile 0.0 – 109.8
CGC CHEYENNE (WLR 75405)	Foot of Iron Street St. Louis, MO 63111-2536	314-481-6750	Mile 109.9 – 200.8
CGC SCIOTO (WLR 65504)	221 Mississippi Drive Keokuk, IA 52632-4219	319-524-7930	Mile 363.0 - 579.5
CGC WYACONDA (WLR 75403)	60 E. First Street Dubuque, IA 52001-7652	319-582-1965	Mile 522.0 - 857.6

MARINE INSPECTION/MARINE SAFETY OFFICES

For the guidance and assistance of those persons needing to contact Commanding Officers; Marine Inspection or Marine Safety Offices, U.S. Coast Guard, the jurisdiction, address, and telephone number of these offices are shown below.

JURISDICTION	ADDRESS	TELEPHONE
ALLEGHENY RIVER	Suite 1150, Kossman Bldg. Forbes Ave. & Stanwix St. Pittsburgh, PA 15222-1371	412-644-5807
ARKANSAS WATERWAY	200 Jefferson Ave., Suite 1301 Memphis, TN 38103-2300	901-544-3941
ATCHAFALAYA RIVER	New Orleans, LA	504-589-6273
BIG SANDY RIVER (West Virginia)	1415 6th Ave. Huntington, WV 25701-2420	304-529-5524
CLINCH RIVER	220 Great Circle Road Suite 148 Nashville, TN 37228-1700	615-736-5421
CUMBERLAND RIVER: Mile 0.0 - 309.2	P.O. Box 7509 Paducah, KY 42002-7509	270-442-1621
Mile 309.2 - 381.0	Louisville, KY	502-582-5194
GREEN RIVER	600 Martin Luther King Jr. Street Room 360 Louisville, KY	502-582-5194
HIWASSEE RIVER	Nashville, TN	615-736-5421
ILLINOIS WATERWAY-ILLINOIS RIVER: Mile 0.0 - 187.3	Robert A. Young Federal Bldg. 1222 Spruce Street, Suite 1.215 St. Louis, MO 63103-2835	314-539-3091
Mile 187.3 - 327.2	610 South Canal Street Chicago, IL 60607-4573	312-353-6601
ILLINOIS WATERWAY: ILLINOIS-CALUMET-SAG CHANNEL ILLINOIS and MISSISSIPPI CANAL (HENNEPIN CANAL)	Chicago, IL Chicago, IL	312-353-6601 312-353-6601
KANAWHA RIVER	Huntington, WV	304-529-5524
KASKASKIA RIVER	St. Louis, MO	314-539-3091
MINNESOTA RIVER	St. Louis, MO	314-539-3091
LOWER MISSISSIPPI RIVER: Mile 95.0 - 507.0	1615 Poydras Street New Orleans, LA 70112-2711	504-589-6273
Mile 507.0 - 882.7	Memphis, TN	901-544-3941
Mile 882.7 - 953.8	Paducah, KY	270-442-1621
MISSOURI RIVER	St. Louis, MO	314-539-3091
MONONGAHELA RIVER	Pittsburgh, PA	412-644-5807

MARINE INSPECTION/MARINE SAFETY OFFICES (Continued)

JURISDICTION	ADDRESS	TELEPHONE
UPPER MISSISSIPPI RIVER:		
Mile 0.0 - 55.3	Paducah, KY	270-442-1621
Mile 55.3 - 351.0	St. Louis, MO	314-539-3091
Mile 351.0 - 857.6	Federal Office Building 180 E. Kellogg Blvd. P.O. Box 65428 St. Paul, MN 55165-0428	612-290-3911
OHIO RIVER:		
Mile 0.0 - 121.6	Pittsburgh, PA	412-644-5807
Mile 121.6 - 374.8	Huntington, WV	304-529-5524
Mile 374.8 - 867.3	Louisville, KY	502-582-5194
Mile 867.3 - 981.0	Paducah, KY	270-442-1621
OLD RIVER		
Mile 0.0 - 6.9	New Orleans, LA	504-589-6273
OUACHITA-BLACK WATERWAY:		
Mile 0.0 - 41.4 (Black River) and Mile 41.4 - 337.1 (Ouachita River)	New Orleans, LA	504-589-6273
RED RIVER		
Mile 6.9 - 140.0	New Orleans, LA	504-589-6273
ST. CROIX RIVER and LAKE ST. CROIX	St. Louis, MO	314-539-3091
TENNESSEE RIVER:		
Mile 0.0 - 652.2	Paducah, KY	270-442-1621
TENNESSEE-TOMBIGBEE WATERWAY:		
Mile 411.9 - 450.7	Paducah, KY	270-442-1621

CORPS OF ENGINEERS RIVER MILEAGE JURISDICTIONS

For the guidance and assistance of those persons needing to contact various Division or District Engineers, Corps of Engineers, U.S. Army, the river jurisdiction, address, and telephone number of such offices are shown below.

JURISDICTION	ADDRESS	TELEPHONE
ALLEGHENY RIVER	District Engineer U.S. Army Engineer District Pittsburgh 1828 Wm S. Moorhead Federal Bldg. 1000 Liberty Ave. Pittsburgh, PA 15222-4186	412-644-6800
ATCHAFALAYA RIVER	District Engineer U.S. Army Engineer District Vicksburg 2101 N. Frontage Rd. Vicksburg, MS 39180-5191	601-631-5266

CORPS OF ENGINEERS RIVER MILEAGE JURISDICTIONS (Continued)

JURISDICTION	ADDRESS	TELEPHONE
ARKANSAS RIVER:		
Mile 0.0 - 308.5	District Engineer U.S. Army Engineer District Little Rock P.O. Box 867 Little Rock, AR 72203-0867	501-378-5730
Mile 308.5 - 395.0	District Engineer U.S. Army Engineer District Tulsa P.O. Box 61 Tulsa, OK 74121-0061	918-581-7311
VERDIGRIS RIVER	U.S. Army Engineer District Tulsa	918-581-7311
BIG SANDY RIVER (West Virginia)	District Engineer U.S. Army Engineer District Huntington 502 Eighth Street Huntington, WV 25701-2070	304-529-5682
CLINCH RIVER	District Engineer U.S. Army Engineer District Nashville P.O. Box 1070 Nashville, TN 37202-1070	615-736-5626
CUMBERLAND RIVER	U.S. Army Engineer District Nashville	615-736-5626
EMORY RIVER	U.S. Army Engineer District Nashville	615-736-5626
HIWASSEE RIVER	U.S. Army Engineer District Nashville	615-736-5626
ILLINOIS WATERWAY:		
Mile 0.0 - 80.0	District Engineer U.S. Army Engineer District St. Louis 1222 Spruce Street St. Louis, MO 63103-2835	314-331-8010
Mile 80.0 - Lake Michigan, East End North Pier Mile 327.2, including Calumet-Sag Channel	District Engineer U.S. Army Engineer District Rock Island Clock Tower Bldg. P.O. Box 2004 Rock Island, IL 61204-2004	309-788-6361
KANAWHA RIVER	U.S. Army Engineer District Huntington	304-529-5682
KASKASKIA RIVER	U.S. Army Engineer District St. Louis	314-331-8010
KENTUCKY RIVER	District Engineer U.S. Army Engineer District Louisville P.O. Box 59 Louisville, KY 40201-0059	502-582-5601
GREEN RIVER	U.S. Army Engineer District Louisville	502-582-5601
LITTLE RIVER	U.S. Army District Engineer Nashville	615-736-5626
MINNESOTA RIVER	District Engineer (CENCS-CO-RF) USACOE District St. Paul U. S. Army Engineer Center, Attn: Library 4th Floor 1905 th St., East St. Paul, MN 55101-1638	612-220-0300

CORPS OF ENGINEERS RIVER MILEAGE JURISDICTIONS (Continued)

JURISDICTION	ADDRESS	TELEPHONE
MISSISSIPPI RIVER (AHP):		
Mile 0.0 - 233.1	District Engineer U.S. Army Engineer District New Orleans P.O. Box 60267 New Orleans, LA 70160-0267	504-865-1121
Mile 233.1 - 303.1	U.S. Army Engineer District New Orleans	504-865-1121
Mile 303.1 - 598.1	District Engineer U.S. Army Engineer District Vicksburg 2101 N. Frontage Rd. Vicksburg, MS 39180-5191	601-631-5266
Mile 598.1 - 955.8 and 2.2 miles up Ohio River	District Engineer U.S. Army Engineer District Memphis Clifford Davis Federal Bldg., B-202 Memphis, TN 38103-1894	901-544-3221
UPPER MISSISSIPPI RIVER:		
Mile 0.0 - 300.0	U.S. Army Engineer District St. Louis	314-331-8010
Mile 300.0 - 614.0	U.S. Army Engineer District Rock Island	309-788-6361
Mile 614.0 - Head of Navigation	U.S. Army Engineer District St. Paul	612-220-0300
MISSOURI RIVER:		
Mile 0.0 - 498.5	District Engineer U.S. Army Engineer District Kansas City 700 Federal Office Bldg. Kansas City, MO 64106-2896	816-426-3201
Mile 489.5 - Head of Navigation including Upper River Reservoir	District Engineer U.S. Army Engineer District Omaha 215 N. 17th Street Omaha, NE 68102-4978	402-221-3905
MONONGAHELA RIVER	U.S. Army Engineer District Pittsburgh	412-644-6800
OHIO RIVER:		
Mile 0.0 - 127.2	U.S. Army Engineer District Pittsburgh	412-644-6800
Mile 127.2 - 438.0	U.S. Army Engineer District Huntington	304-529-5682
Mile 438.0 - 981.5	U.S. Army Engineer District Louisville	502-582-5601
OUACHITA-BLACK WATERWAY:		
Mile 0.0 - 41.4 (Black River) and Mile 41.4 - 192.5 (Ouachita River)	U.S. Army Engineer District Vicksburg	601-634-5000
RED RIVER:		
Mile 0.0 - 140.0	U.S. Army Engineer District Vicksburg	601-631-5266
ST. CROIX RIVER:		
Mile 0.0 - 52.0	U.S. Army Engineer District St. Paul	612-220-0300
TENNESSEE RIVER	U.S. Army Engineer District Nashville	615-736-5626

CORPS OF ENGINEERS RIVER MILEAGE JURISDICTIONS (Continued)

JURISDICTION	ADDRESS	TELEPHONE
TENNESSEE-TOMBIGBEE WATERWAY: Mile 411.9 - 443.4	U.S. Army Engineer District Mobile P.O. Box 2288 Mobile, AL 36628-0001	205-690-2511
Mile 443.4 - 450.7	U.S. Army Engineer District Nashville	615-736-5626
WHITE RIVER Mile 0.0 - 10.3	U.S. Army Engineer District Little Rock	501-378-5730